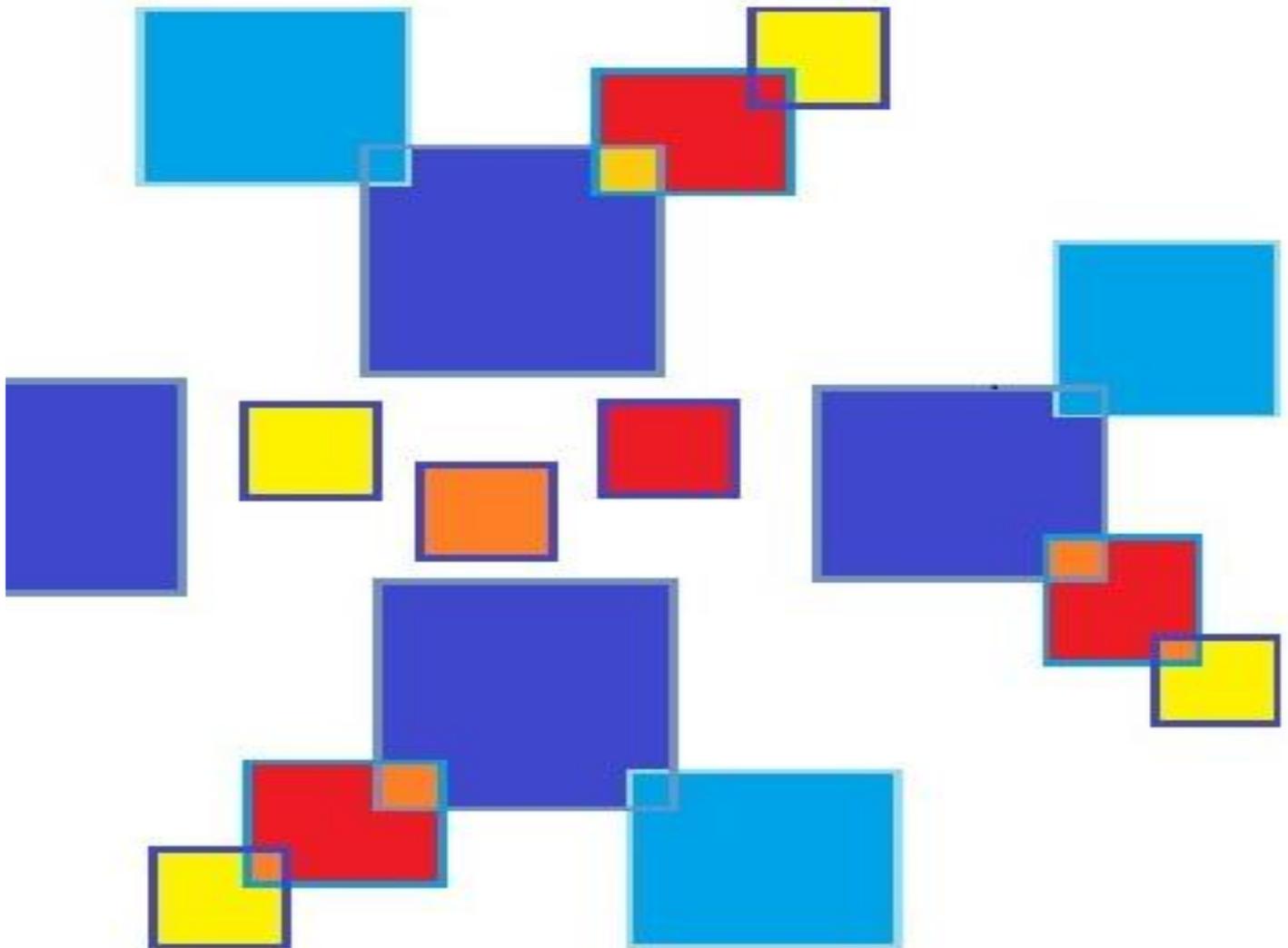


2014

Evaluating Connecticut's Health Information
Technology Exchange

Executive Summary



Prepared for
Connecticut Department
of Public Health

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Executive Summary

In 2010, the Connecticut Department of Public Health (DPH) entered into a Cooperative Agreement with the Office of National Coordinator for Health Information Technology (ONC), to create and implement a State Health Information Exchange (HIE). DPH received an award of \$7.3 million to initiate and sustain HIE activities in the state of Connecticut. The Health Information Technology Exchange of Connecticut (HITE-CT), a quasi-public agency, was created by [Public Act 10-117](#), "An Act Concerning Revisions to Public Health Related Statutes and the Establishment of the Health Information Technology Exchange of Connecticut," Sec. 82-90,96 (codified at CGS §19a-750(c)(1)), by the 2010 Connecticut General Assembly and Governor Rell. HITE-CT received \$4.3 million over the course of three years to create and implement an HIE infrastructure and facilitate exchange activities in the state. Additionally, DPH contracted with the University of Connecticut Health Center (UCHC) to evaluate the ongoing development and implementation of Connecticut's Health Information Exchange (CT-HIE).

At the time of this report Connecticut does not have an operational statewide Health Information Exchange. This executive summary is based on the set of detailed reports.^{1,2,3,4,5} At the end of the cooperative grant period on March 14, 2014, the HITE-CT had bought two assets: a Provider Directory (PD) and an Enterprise Master Patient Index (EMPI) and had one full-time employee. The PD was deployed in a very basic development environment at the Bureau of Enterprise Systems and Technologies.

We received 629 responses from Connecticut residents between 8/10/2011- 12/20/2013 to a telephone survey asking about perspectives on HIT and HIE. These responses give us insights into how consumers might use EMRs, PHRs, and HIE should they become universally available. The estimates of Connecticut consumers' perspectives on HIT and HIE offer meaningful information to state policy makers and stakeholders as they engage in strategic planning for purchase and implementation of health information technologies. Better understanding the needs of our residents will help ensure that the HITECH Act's overarching goal of facilitating the availability of health information in support of a connected and seamless health care delivery system with improved treatment outcomes is achieved.

¹ Tikoo M, Costello D. *Evaluating Connecticut's Health Information Technology Exchange: Consumer Survey Report*. Farmington, CT: University of Connecticut Health Center; 2014.

² Tikoo M, Costello D. *Evaluating Connecticut's Health Information Technology Exchange: Physician Survey Report*. Farmington, CT: University of Connecticut Health Center; 2014

³ Tikoo M, Hilario H. *Evaluating Connecticut's Health Information Technology Exchange: Stakeholder Report*. Farmington, CT: University of Connecticut Health Center; 2014.

⁴ Tikoo M, Langton C. *Evaluating Connecticut's Health Information Technology Exchange: Pharmacy Survey Report*. Farmington, CT: University of Connecticut Health Center; 2014.

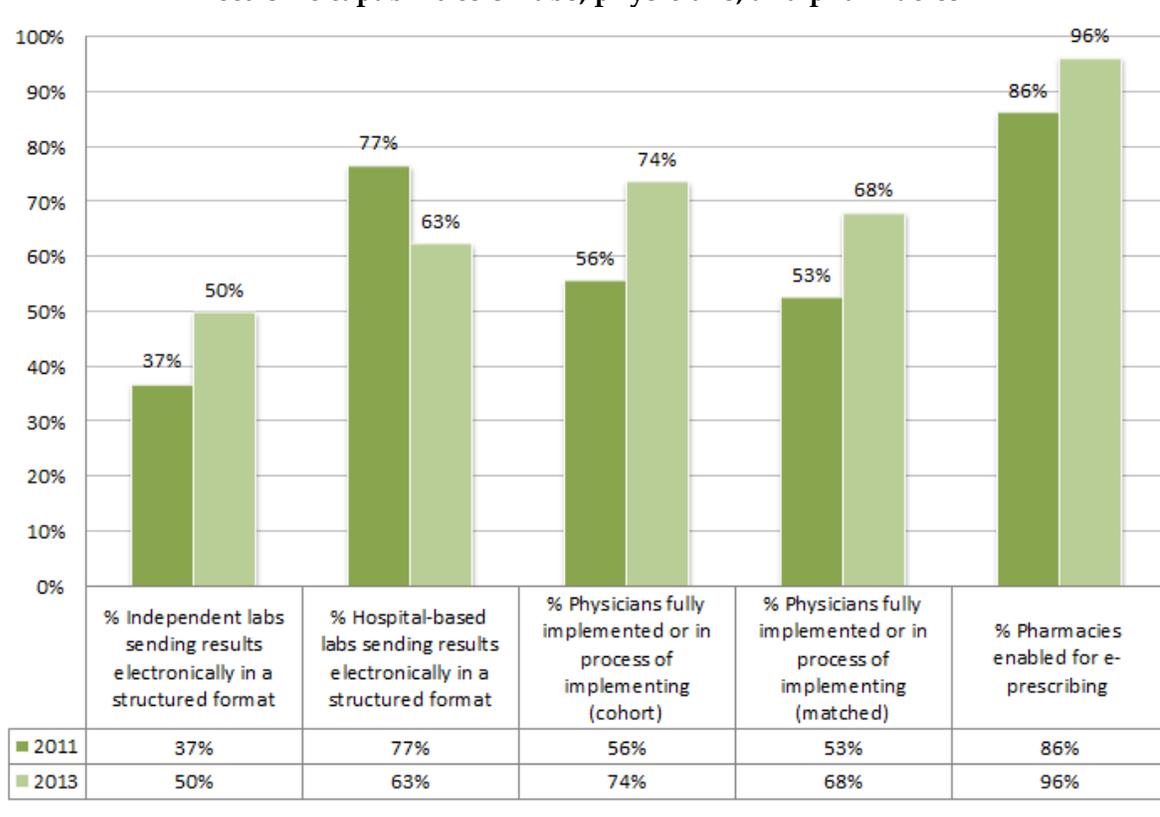
⁵ Tikoo M, Roy A. *Evaluating Connecticut's Health Information Technology Exchange: Laboratory Survey Report*. Farmington, CT: University of Connecticut Health Center; 2014.

We received 1,346 responses (880 from the 2011 survey and 466 from the 2013 survey) representing 1,082 unique physicians. 616 physicians completed a survey during the first distribution only (2011 Cohort 1), 202 physicians completed a survey during the second distribution only (2013 Cohort 2), and 264 physicians completed surveys at both points (2011 Baseline and 2013 Follow-Up). The goal of the physician survey was to measure the rate of EHR adoption, extent of interoperability, and assess the knowledge and attitudes of physicians toward the creation of a Health Information Exchange. Now we know what physicians practicing in Connecticut think about Connecticut’s efforts in the HIT and HIE. They inform us about their level of EHR adoption, and report on the challenges that they face while implementing HIT solutions.

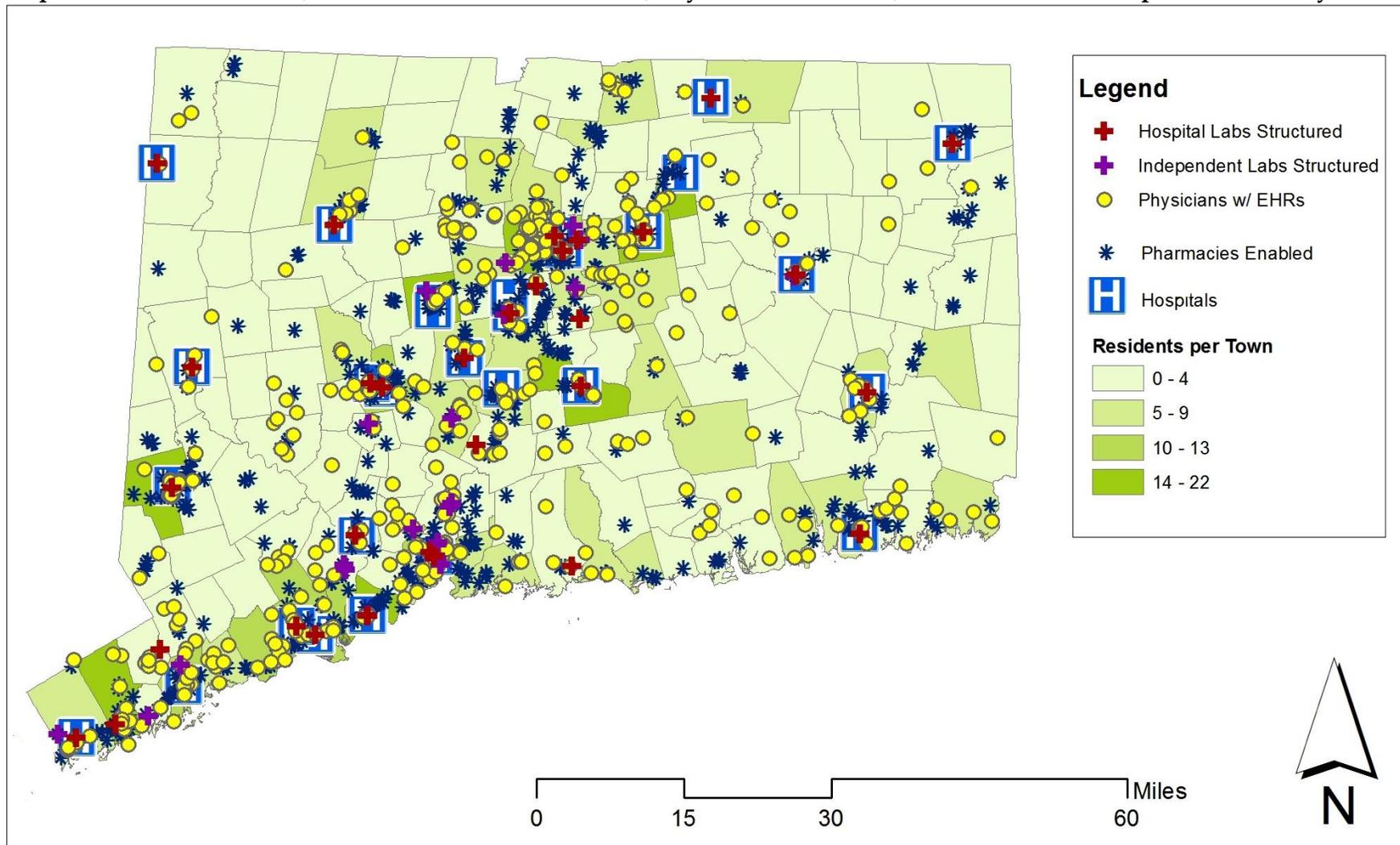
E-prescribing activities increased from 2011 to 2013 among pharmacies and prescribers. 96% of the pharmacies were enabled for processing e-prescriptions and 62% of the prescribers were e-prescribing. Independent pharmacies were more likely than chain/franchise pharmacies to indicate prescription transaction fees, low prescriber activity and maintenance costs as barriers to implementing e-prescribing.

In 2013, 63% of the Connecticut’s hospitals were sharing lab results electronically which is higher than the national average of 56%. This represents a significant decrease from 77% in 2011-12. 50% of the independent labs were sending lab results electronically in 2013, an increase from 37% in 2011-12. Due to the low number of labs that responded to our survey, the results should be interpreted with caution.

Electronic capabilities of labs, physicians, and pharmacies



Map of Enabled Pharmacies, Labs that send Structured Data, Physicians with EHRs, & Residents that Completed the Survey



What are Connecticut residents saying?

We received 629 responses from Connecticut residents between 8/10/2011- 12/20/2013 to a telephone survey asking about perspectives on HIT and HIE. This survey was intended to assess people's awareness of and readiness for health information technologies, to learn how best to engage consumers in the state's efforts to develop an HIE, and to develop strategies to support consumers' HIT adoption.

Descriptive Characteristics of Connecticut Residents (N=629)

- Nearly two-thirds (64%) of participants were female.
- Ages ranged from 18 to 92 and the median age was 59.
- Nearly a third (31%) of the sample was 65 or older.
- Most participants (79%) were white.
- More than half (57%) had a college degree or higher.
- The median household income was \$80,000; 20% reported a household income of \$100,000 or higher.

54% of the participants described their health as excellent or very good.

89% of participants were satisfied with the care they received from their doctor or physician's assistant.

87% of participants said they understood what their doctor said to them during their last visit.

Current Health, Health Care, and Satisfaction with Care

- 54% of participants described their health as excellent or very good.
- 34% of participants said they had a chronic health condition.
- 24% of participant reported 1-2 visits, 25% reported 3-4 and 36% reported more than 4 visits to a doctor or physician's assistant in the last 12 months.
- 89% of participants were satisfied with the care they received from their doctor or physician's assistant.
- 49% of participants reported that their physician's office had implemented an electronic medical record system and a third said they were not sure.

Health Literacy and Sources of Health or Medical Information

- 63% of participants said they read the printed health-related information they received from their physician and most participants said the material was not difficult to understand (61%) and did not contain words they were unfamiliar with (56%). However, when words in the printed materials were unfamiliar, fewer than half (42%) asked for an explanation.
- 87% of participants said they understood what their doctor said to them during their last visit and most (80%) participants who did not understand something their doctor said to them reported receiving an explanation.
- 79% of participants reported having ever looked for information on health or medical topics. Most common source (87%) was the Internet followed by a physician (15%).
- 48% had used the Internet to find health-related information in the past month.

Awareness of HIE and HIT

- 83% of participants had heard about electronic medical records.
- 65% of participants had heard about the electronic health information exchange.
- 50% of participants had heard of personal health records.
- 83% had never heard of the Connecticut Health Information Exchange.
- Demographic (education, gender) and individual characteristics (online experience, having a chronic health condition or a doctor with an EMR) were associated with increased awareness of HIE and HIT.

Attitudes toward HIE

- 72% supported a national HIE that was driven by patient consent.
- 57% reported that concern about privacy was the single most important barrier that was likely to get in the way of a national HIE.
- 64% expressed support for an “opt-in” and 21% supported “opt-out” consent model.

Perceived Benefits of HIT

- Most participants thought HIT adoption offered benefits in terms of:
 - better quality of care (73%),
 - better doctor-patient interaction (68%),
 - fewer medical errors (65%), and
 - reduction in duplicate tests and procedures (71%).
- 53% of participants reported an interest in having an electronic personal health record where they could manage their health information on a secure website.
- 57% of participants reported an interest in allowing their de-identified health information from their doctor’s EMRs to be shared with outside entities such as health insurance plans, researchers, and other companies.
- 47% cited privacy concerns as the reason for their lack of interest in having access to an electronic personal health record and 74% cited privacy concern as the reason for their lack of interest in allowing access to their de-identified health information.
- Participant trust in the organization in charge of collecting and maintaining their information (38%) and feeling that the organization had policies to safeguard their privacy (35%) were mentioned most frequently as factors that might persuade people to change their mind on sharing of health information.
- 87% reported they would not intentionally withhold information from their doctor. However, if consumers thought their de-identified health information might be shared via their doctor’s EMR, the proportion of consumers who said they were unsure if they would intentionally withhold information shifted from 3% to 9%, primarily due to privacy concerns.

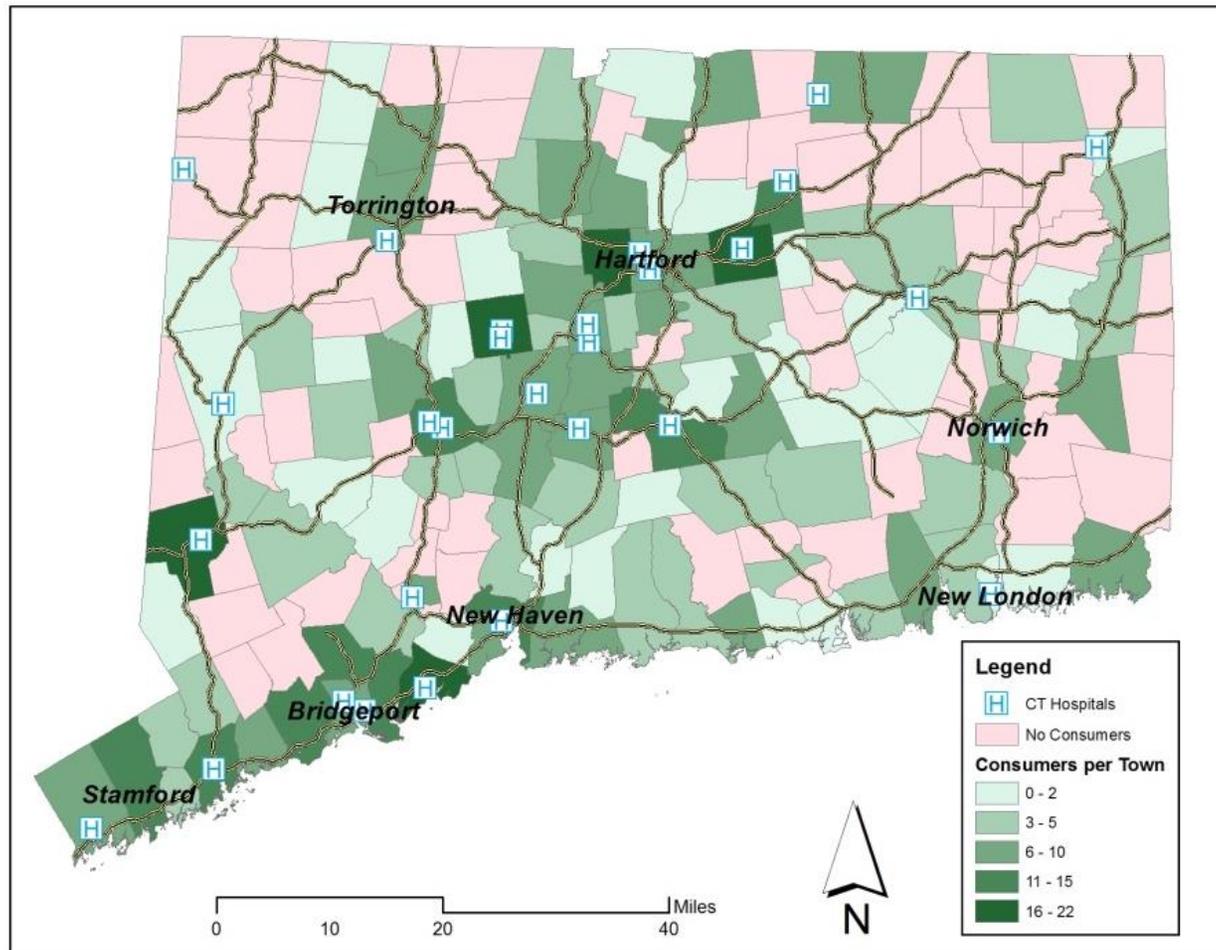
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Connecticut residents that responded to the survey

Residents from all counties and 109 towns in Connecticut responded to our survey.



What are the physicians practicing in Connecticut saying?

The 2013 EHR adoption rate among physicians practicing in Connecticut is between 53-62% compared to 38-40% in 2011. This is lower than the national average of 78%.

We received 1,346 responses (880 from the 2011 survey and 466 from the 2013 survey) representing 1,082 unique physicians. Six hundred sixteen physicians completed a survey during the first distribution only (2011 Cohort 1), 202 physicians completed a survey during the second distribution only (2013 Cohort 2), and 264 physicians completed surveys at both points (2011 Baseline and 2013 Follow-Up). The goal of the physician survey was to measure the rate of EHR adoption, extent of interoperability, and assess the knowledge and attitudes of physicians toward the creation of a Health Information Exchange. These responses provide valuable insight into what the physicians in Connecticut think about Connecticut's efforts in the HIT and HIE space, inform us about the level of EHR adoption, and report on the challenges associated with implementing HIT solutions.

Physicians are increasingly adopting EHRs and participating in the EHR incentive program. The current rate of EHR adoption is between 53-62%, which is lower than the national average of 78%.

Physician Characteristics

- 2 out of 3 physicians were male.
- Age ranged from 29 to 88 with an average age in the mid-fifties.
- 8 out of 10 physicians were white and 9 out of 10 were non-Hispanic/Latino.
- Years of practicing medicine ranged from 1 to 56 years with a mean of over 20 years.
- 1 in 2 physicians reported they had "a lot" of computer experience.

Practice Characteristics

- Almost 6 out of 10 physicians were certified in a primary care specialty.
- 1 in 2 physicians reported working at a single practice site and 40-50% of physicians were from small (up to 3 physicians) practices.
- 7 out of 10 physicians saw the majority of their patients in an outpatient primary care setting and 1 in 2 characterized their practice as a single specialty group or partnership.
- 95% of physicians were not affiliated with the Veteran's Administration health care system.
- 9 out of 10 physicians saw more than half of their patients at their main practice site. Around 50-60% of physicians reported up to 100 patient visits at their main practice site during the past week.
- A third or more of physicians received more than half of their patient revenues from private insurance payments.

Technology Infrastructure

- Most physicians reported some form of high-speed Internet access, with cable or digital subscriber line (DSL) being the most prevalent type of service.
- Fewer than 1 in 5 physicians said they needed additional Internet access at any of their practice sites.

Computerized Systems Use

- The majority of physicians reported their practice used at least some electronic billing, with the proportion of practices using electronic billing exclusively increasing significantly over time from 2011 to 2013.
- In 2011, 41% of the Cohort 1 physicians used EHR systems compared with 59% of the 2013 Cohort 2 physicians.
- 8 out of 10 physicians had a computerized system that gathered patient demographics. The proportion of physicians with computerized systems which gathered other patient health information (e.g., record lists of patients' health problems and medications, record clinical notes) increased significantly between 2011 and 2013 for both sub-samples.
- In terms of order entry management (e.g., ordering prescriptions, lab, or radiology tests), there was a similar pattern of significant increases in prevalence between 2011 and 2013 for both sub-samples.
 - By 2013, 83-87% of physicians whose computerized systems allowed them to order prescriptions said their systems provided warnings of drug interactions or contraindications.
 - Over 85% said they used their systems to order prescriptions electronically.
 - At least 7 out of 10 physicians reported they had computerized systems that allowed them to view lab results and around half were able to use their systems to view imaging results. More than half of physicians said electronic images were returned to their systems.
- Relatively few physicians had computerized systems that enable public health reporting, although the proportions increased significantly in both sub-samples: from 6-7% in 2011 to 10-11% in 2013.
- Support for creating or receiving documents related to continuity of care was also relatively uncommon (6-26%), but tended to increase from 2011 to 2013.
- Computerized systems that generated reminders for guideline-based interventions and screenings increased significantly from around 25% in 2011 to 33-41% in 2013.
- Over a third of physicians reported that their computerized systems were capable of providing patients with electronic copies of health information and clinical summaries of visits.

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- The proportion of physicians who reported using each clinical function of their computerized system “most or all of the time” increased over time. For the 2011 baseline and 2013 follow-up samples, the prevalence of five clinical functions increased by 10 or more percentage points: medication lists (37% to 51%), record clinical notes (39% to 50%), order radiology tests (20% to 31%), and patient problem lists (35% to 45%).

Acquisition and Implementation of EHR systems

- In the 2011 survey, 38-40% of physicians said their practice had fully implemented an EHR system compared with 53-62% in 2013.
- Of those physicians whose practices had acquired or were in the process of implementing their EHR system, around one half expected to have completed their implementation within the next 12 months.
- Between 20-30% of physicians whose practices were in the process of implementing or had fully implemented their EHR system said they had been using the system for more than five years.
- During 2013, 57.2% of physicians reported their main practice site had fully-implemented EHR systems and 13.3% were in the process of implementing an EHR.
- Allscripts was the most commonly used system in both 2011 and 2013.

Factors Associated with EHR Adoption

- In 2011, the odds of EHR adoption were higher among physicians who reported they had “a lot” of computer experience, and those who worked in larger practice groups.
 - In 2013, the odds of EHR adoption were higher among primary care (versus specialty care) physicians and those who worked in larger practice groups.
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Effects of EHRs on Clinical Practice

- Between 36% to 52% of physicians felt that their EHR system had a positive effect and 38-51% of physicians felt that their EHR system had no effect on the quality of clinical decisions.
- 8 in 10 physicians said that their EHR system had a positive effect on timely access to medical records.
- More than half of physicians said their EHR system had a positive effect on preventing medication errors. Notably, few physicians felt their EHRs had a negative effect on quality of care.
- Between 64-74% of physicians reported that their EHR system had a positive effect on prescription refills.
- EHR systems appeared to have limited effects on the delivery of preventive and chronic disease care meeting practice guidelines.
- Relatively few physicians felt their EHR had a negative effect on the delivery of care.

- The majority of physicians indicated that their EHR system had improved communication with other providers. But 4 in 10 physicians said their EHR system had no effect on communication with patients.
- More than half of physicians whose practices had fully-implemented EHR systems were satisfied with their systems.

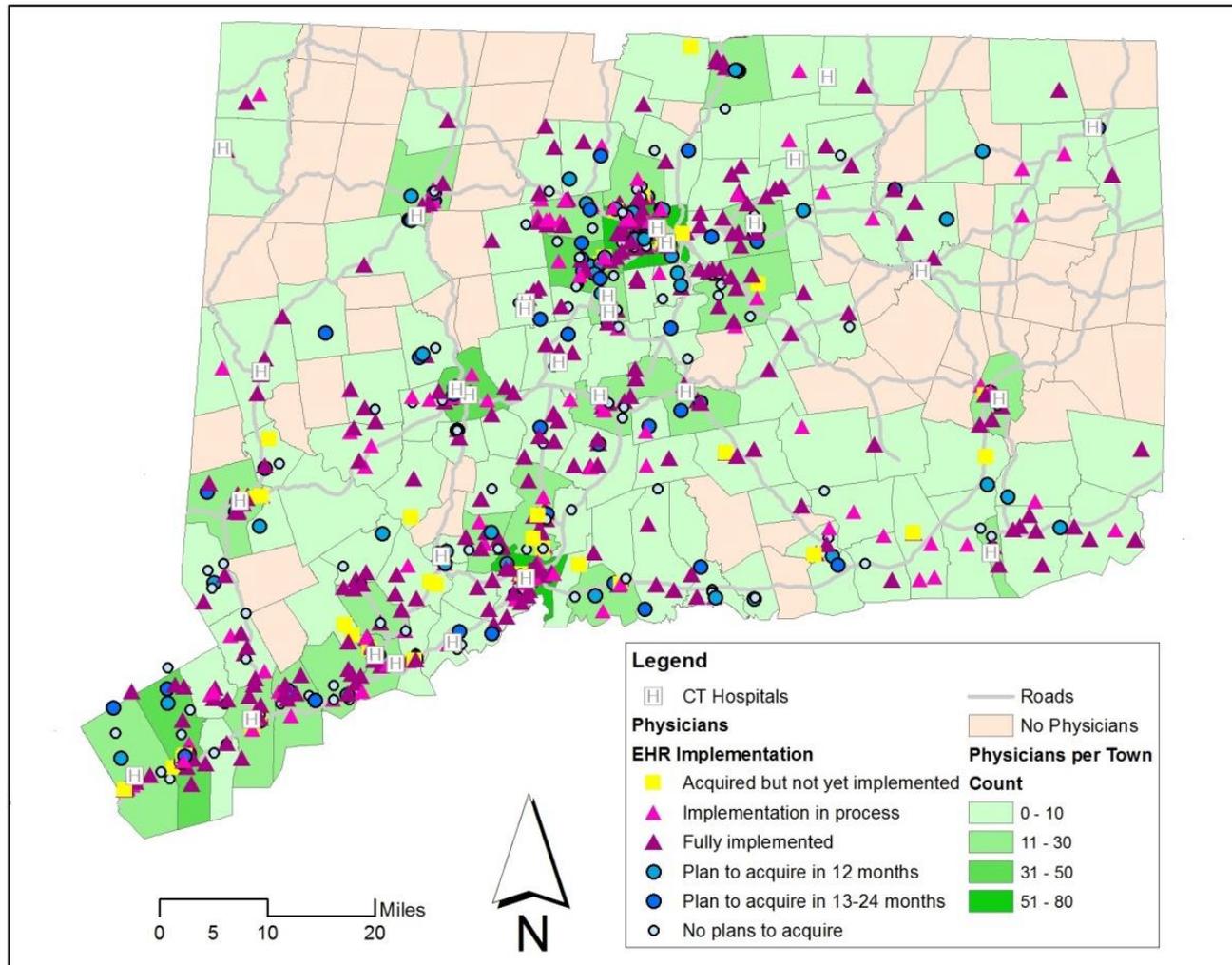
Certification Standards and Centers for Medicare and Medicaid Incentive Programs

- 3 in 10 physicians said that their EHR was integrated with a hospital system.
- 8 in 10 physicians said their system met federal certification standards.
- Over a third of physicians did not know if they qualified for the Centers for Medicare and Medicaid EHR incentive programs.
- Incentives for adoption of EHRs
 - Around half of physicians said that incentives and additional payments would have a major positive effect on the decision to adopt an EHR system.
 - Around 40% of physicians felt that legal protection from personal liability in the event of privacy and security breaches would have a major positive effect on EHR adoption decisions.
 - More than half of physicians felt that certification standards could have a major or minor positive effect on the decision to adopt an EHR.
 - Around 20% of physicians said that the decision to adopt an EHR could be motivated by legal liability arising from not using the latest technology.
- Barriers to adoption of EHRs
 - EHR-related costs were seen as a significant barrier by the majority of physicians.
 - Around half of physicians cited uncertainty about the return on their investment in an EHR as a major barrier to adoption.
 - Concern about having the capacity to undertake all phases of EHR implementation (i.e., to select, contract, install, and implement an EHR system) was mentioned by 37-47% of physicians.
 - Between 30% and 37% of physicians mentioned physician resistance as a major barrier to EHR adoption.
 - Physicians appeared relatively unconcerned about legal barriers to EHR adoption. Between two-thirds and three-quarters of physicians said concerns about inappropriate disclosure of patient information, illegal record tampering, or legal liability resulting from patients' access to medical records were minor barriers or not barriers at all to EHR adoption.
 - 9 in 10 did not think that adoption would be constrained by concerns about the legality of a hospital-donated EHR.
 - Finding an EHR system that meets providers' needs was mentioned as a barrier by more than half of physicians. Between 41-46% of physicians expressed concerns that the EHR system would become obsolete.

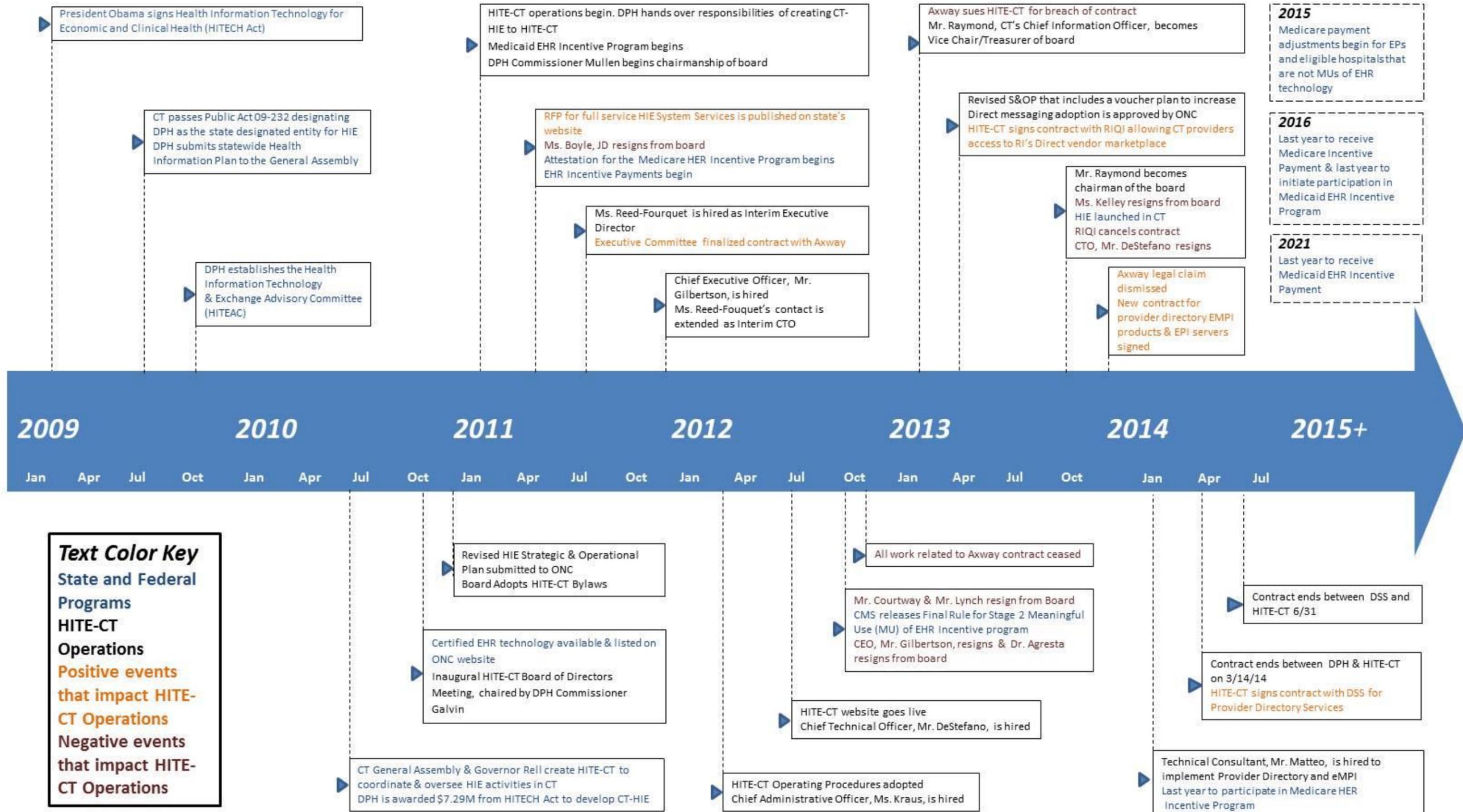
Health Information Exchange and PHRs

- 60-64% of physicians were not familiar with the Connecticut Health Information Exchange (CT-HIE).
- 3 out of 4 physicians had not heard of Connecticut's Regional Extension Center (REC) (eHealthConnecticut) and the majority (63-73%) had not used REC services.
- The majority of physicians' write-in comments echoed the lack of awareness of the CT-HIE. Other comments suggested physicians were interested in learning more about the CT-HIE or looking forward to using it when it is established.
- Support for adoption of patient personal health records (PHRs) was divided, with 40% of physicians expressing support and 30-40% saying they did not know if they supported PHRs. Physicians offered a variety of reasons for supporting PHRs related to improvements in health care quality, safety, efficiency, and patient empowerment. Reasons given for lack of support for PHRs included concerns about privacy and security, lack of interest or technology skills, perceived lack of benefit to patients, and cost (both in terms of time and money).

Locations of physicians by EHR adoption



HITE-CT Timeline at a Glance



HITE-CT Timeline at a Glance

What are the stakeholders saying?

This section summarizes data collected from the various stakeholders involved with the initial advisory committee, the HITE-CT board of directors, and external professionals with expertise in the HIT field. Data collection methods included online surveys, freelisting exercises, one-on-one stakeholder interviews and content analysis from HITE-CT board of director meeting transcripts and meeting minutes. This section reflects qualitative and descriptive quantitative analyses within the time frame of October 2010 - January 2014.

At the end of the cooperative grant period on March 14, 2014, the HITE-CT had bought two assets: a Provider Directory (PD) and an Enterprise Master Patient Index (EMPI) and had one full-time employee. They had spent 4.3 million over the course of the cooperative agreement. The PD was deployed in a very basic development environment with a potential customer in Department of Social Services (DSS). A use case for the EMPI is still to be defined, though HITE-CT may be able to make their case to deliver services to Access HealthCT which is currently in need of both a PD and an EMPI. HITE-CT had signed a contract with DSS ending on June 30, 2014 to deliver a standards-based Health Provider Directory.

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HITE-CT Board Membership, Committees, and Contribution

- The board was designed to have 20 seats, though actual board membership varied throughout the timeframe of this analysis, due to changes in administration and resignations. At the start of HITE-CT operations in January of 2011, there were 19 active board members and 1 vacant seat for the representative of primary care physician whose practice utilizes EHRs. By October 2013, there were a total of 6 vacant seats on the board representing 5 resignations and 1 which was never filled.
- Five standing committees were adopted with a minimum of two board members required to serve on each and an Executive Committee.
 - Legal and Policy: Ms. Boyle (Chair 1) & Mr. Lynch (Chair 2)
 - Business and Operations: Mr. Lynch (Chair) & Dr. Agresta
 - Technical: Mr. Courtway (Chair) & Dr. Agresta
 - Finance: Mr. Carmody (Chair) & Mr. Carr
 - Special Populations: Mr. Masselli (Co-chair) & Ms. Kelley (Co-chair)
 - Executive Committee: Comprised of the Chair, Vice Chair/Treasurer, Secretary, and the Chairs of the standing committees

Internal Collaboration

- Overall, HITE-CT respondents represented low integration levels (networking and cooperating) in their reflection of HITE-CT's purpose. However, in regard to its strategies, leadership and decision-making, and interpersonal communication, almost half the respondents rated HITE-CT's integration at the higher levels of partnering and merging.

- Most state agency representatives took a back seat when it came to early decision making on the board. Bureau of Enterprise and Systems Technology (BEST) was the most involved of the state agencies (17 motions) followed by DPH (7 motions) within the first 26 months.
- The most active seats in the first 26 months of the board were the insurer/representative of a health plan making 32 motions and the representative of a large business group made 19 motions. There was high reciprocal support between these two board members.
- Public representatives had the most dissention when it came to HITE-CT decision making. Three of the seven oppositions from the first 2.5 years of HITE-CT operations concerned the consent model.
- In the period of third chairmanship, DSS was the most active state agency with regards to initiating HITE-CT decision making (10 motions) and had the most supportive ties (3).

External Collaboration

- A '3C3 Team' was organized to emphasize the importance of communication, collaboration and cooperation between HITE-CT, DPH, DSS, eHealth Connecticut and Capital Community College, all recipients of ONC funds. Though interagency stakeholder meetings were held with the intention to leverage each other's strengths, little collaboration occurred after the Connecting Connecticut conference in October 2011.
- Axway Partnership
 - In October of 2012, all work related to the Axway contract ceased.
 - In January of 2013, Axway filed a lawsuit against HITE-CT for breach of contract.
 - No work was accomplished for over one year.
 - A new contract was agreed upon and signed in December 2013, at which point all charges against HITE-CT were dismissed. This new contract includes services for a provider directory and enterprise master patient index.
- Rhode Island Quality Institute Partnership
 - After just 5 months of a partnering with HITE-CT, RIQI canceled its contract in November of 2013. This was a significant loss for the agency as this collaboration would have helped HITE-CT stand DIRECT, which was the primary requirement of ONC. This withdrawal of support was indicative of the lack of faith in HITE-CT's viability.

Structural Challenges

- One challenge the board faced was figuring out how to effectively work within the confined nature of the quasi-public agency structure.
- Though some board members found the composition of the board impressive, many raised concern about need for broader representation.
- Declining membership was also a problem that exacerbated the challenge for sufficient constituent representation. The first board resignation came 4 months into HITE-CT operations.
- As membership continued to decline, it became challenging to meet quorum.

- The resignations of Chief Executive Officer, Mr. Gilbertson in August of 2012 and Chief Technical Officer, Mr. DeStefano in November of 2013 placed significant challenges on leadership and operations of HITE-CT.

Financial Challenges

The December 2010 business model that the board adopted required significant sales revenue. Hence, from the onset, HITE-CT was faced with the challenge of building a robust business model to support its operations, as federal funding for the initiative was time limited and state funding to support HIE development and operations was absent.

We should at least look at the money we have coming from ONC and say, what do we absolutely need to satisfy to do some of the functions that are not going to be the vendor that we're going to select? ... I think that we're going into this (vendor selection) without enough information. ... it's been worrying me because I know that the amount of money isn't that great and I can't believe that we're just going to hire a vendor and the vendor is going to do everything and there's not going to be any need for anything else. So that's my anxiety level right now being a member of this Board. (04/18/11 Board of Directors Meeting)

Technical Challenges

The vendor solution developed didn't meet needs of the intended major customer base. Additionally, the vendor was unwilling to negotiate a reduced scope of services and had no capacity to implement Direct messaging protocol. Though hospitals and physicians agreed on the concept of a statewide HIE, the technology needed to be developed precisely for intended client needs and budget. The failed business model is explained below:

It didn't work and it didn't work for a number of reasons....And the customers, although they did say they think it's a good idea, I don't think you would go to anybody in the state, a hospital provider, anybody who would say that this is not a good idea. But the return on investment was the issue and the model that came forward from HITE/CT was not a model that they were comfortable with.... Although you can plug into what we had put up in the cloud pretty easily, because it is all based on standards, the market in general wasn't really ready. There aren't that many hospitals in the state who are ready to do this, frankly there are very few. And from the provider office perspective and the large providers, again, there are very few who are really ready to do this... In Connecticut, we have a ways to go in our marketplace before we're really ready to move forward with this. (08/07/13 Board of Directors Meeting)

Legal Challenges

HITE-CT found itself in contracts that were binding and had difficulty re-negotiating contracts with the vendor as well as DPH. Some of this was due to inexperience and some was due to early reliance on interim contractors making critical technological and operational decisions.

Governance Challenges

- While some members appreciated the leadership role that DPH initially took, some thought from a business perspective that DPH wasn't the right fit to lead HITE-CT.
- One area where leadership was noticeably lacking was in the formation of a Business and Operations subcommittee. Though a solid business plan was critical for the success

of HITE-CT, the committee was never assembled. HITE-CT CEO, Mr. Gilbertson emphasizes the importance of assembling this committee at his second board meeting:

This committee will be the nuts and bolts of how this thing is actually going to work beyond the technology. So, you've got the technology and then what do you do with the technology and how do you manage it? And that's the Business and Operations Committee, otherwise we'll have a really nice technology but nobody will know what to do with it. (12/19/11 Board of Directors Meeting)

The need to assemble this committee was raised several times, though a group was never successfully brought together:

That's been our problem; we haven't been able to get this Operational Committee to operate. (04/16/12 Board of Directors Meeting)

- Some members felt that decision making on the board was an insular process and that not only minor, but important decisions were being made behind closed doors. This perspective was expressed during a discussion concerning the hiring of the CTO without a benefits package in place:

I didn't know we'd (decided) that. That's kind of my issue is that a lot of things get done here, and maybe it happens in the Executive Committee, but that's a really important question to me. I'm an advocate for people who don't have health insurance. I would have been paying attention to that and I feel that that decision was taken away from me because we've already done it. I'm concerned that if we go forward now that that will just be the way it's done, and then it will be, you know, 'you're just trying to slow things down'. (04/16/12 Board of Director Meeting)

- Just six months from the end of funding, in October 2013, the need for a new sustainability model for HITE-CT was addressed by the creation of the Sustainability Work Group. Though, a new plan was imperative for HITE-CT operations to continue, the group only assembled once, and though priorities were identified, no specific recommendations were made to the board from this group.

Interpersonal

Public representatives were concerned with the conflicts of interest on the board, which led to feeling of mistrust, and fear that members would be unduly influenced by personal interests.

Consumer and Public Education

The HITE-CT consent model was a highly contested issue. The initial consent model recommended by the Health Information Technology and Exchange Advisory Committee (HITEAC), as described in the 2010 Strategic and Operational Plan, was based on,

"presumptive inclusion of all personal health information (PHI) in the HIE with an individual having the right to prohibit disclosure of his/her PHI by the HIE to others... The HITEAC deliberately refrained from using the terms 'opt-in' and 'opt-out' "in order to avoid confusion and to focus on the functions of the HIE as it relates to patient consent."

Though the consent model was consistent with current federal and state confidentiality laws and regulations, the decision to not identify it specifically as an opt-out policy, lead to confusion.

Sustainability

Early on in HITE-CT operations, board members expressed fears that HITE-CT would not succeed. Prior to any contract issues or failed initiatives, the perceived sustainability of the CT-HIE over the next ten years was moderate at best.

“Timing may mean everything; we may not have staying power.”
In the next 20 years, HIE *“will become a utility, just like power.”*

Future of HITE-CT

As summarized by a board member:

I mean when we started this effort off, we had a handful of core assets that we were going to be able make available to the marketplace. Long story short...we don't really have any customer base or client base that is calling for those assets to be enabled. So that was going to create the sustainability. So then the question that I would have is, how does the state look at the assets that we have or we will retain after we resolve some of our outstanding issues with some of our vendors, and how does that fit in to that overarching architecture? At this point if we don't have a major grouping to handle that, which was basically for all intents and purposes the hospital system, if the hospital systems don't see us as wanting to come and shop at our doorstep, where are we looking to take these assets and enable them within state architecture? And if not, then I guess we have to look at ourselves and say...“We don't have a sustainability model. We don't have a client base, and we're not getting contributions from the state that fund what we needed of these assets and incorporated into a state architecture.” Unfortunately, I think it's time to talk about you unwind where we're at. (10/01/13 Board of Directors Meeting)

Our final recommendations include:

The board should be comprised of experienced members free from perceived or actual conflicts of interest and those who are willing to attend meetings in person. No seats on the board should be left vacant for more than a quarter.

HITE-CT should create a viable and realistic business model and develop use cases that are attractive to its customer base.

Need to engage the public through education and outreach.

What are the pharmacies telling us about e-prescribing?

We received 73 responses in 2011 and 216 in 2013 based on surveys administered to licensed pharmacies in Connecticut to measure e-prescribing adoption rates among community pharmacies, gather pharmacists' opinions regarding the impact and value of e-prescribing, and gauge awareness of activity surrounding CT-HIE.

The proportion of pharmacies utilizing e-prescription systems in 2013 (96%) was significantly higher in comparison with 2011 (80%).

E-prescribing activities increased from 2011 to 2013 among pharmacies and prescribers. 96% of the pharmacies were enabled for processing e-prescriptions and 62% of the prescribers were e-prescribing. Independent pharmacies were more likely than chain/franchise pharmacies to indicate prescription transaction fees, low prescriber activity and maintenance costs as barriers to implementing e-prescribing.

Descriptive Characteristics of Pharmacies

- More than 70% of survey respondents represented pharmacies in towns categorized as urban periphery or urban core in 2011 and 2013.
- 59% of the responding pharmacies characterized themselves as independent in 2011 while 46% characterized themselves as independent pharmacies in 2013.
- Almost 64% of pharmacies reported Medicare as the most prevalent form of insurance utilized by customers, followed by private insurance, Medicaid and self-pay.
- A large proportion of survey respondents indicated an average daily prescription volume of 101 to 300 prescriptions with 60% of pharmacies indicating this volume range in 2011 and 54% in 2013.

Significant Changes between 2011 and 2013 in Methods of Receiving Prescriptions

- The proportion of pharmacies utilizing e-prescription systems in 2013 (96%) was significantly higher in comparison with 2011 (80%).
- There was a decline from 2011 to 2013 in the use of interactive voicemail (48%, 33%).
- The proportion of pharmacies that received new and/or renewal prescriptions by paper increased significantly from 85% in 2011 to 97% in 2013.

Level of Understanding

- Slightly more than half of respondents reported a deep understanding of e-prescribing in 2013 compared with 33% in 2011.

Prescribing Activity

- The proportion of e-prescribing activity among prescribers increased from 2011 to 2013, with 62% reporting more than half to all prescribers in the area as e-prescribing in 2013 versus 22% reporting this percentage range in 2011.
- The proportion of pharmacies enabled in 2013 (96%) was greater than the proportion who were enabled in 2011 (86%).

Influence of e-Prescribing on six IOM Domains

- From 2011 to 2013 there appeared to be a general shift from positive responses to more neutral responses, or occasionally, more negative responses regarding the influence of e-prescribing over pharmacy practice.
- Fewer respondents in 2013 reported potential positive influence of e-prescribing on their pharmacy practice in comparison to 2011: Efficiency (82% vs. 86%), Patient Safety (60% vs. 82%), Patient-Centeredness (46% vs. 70%), Effectiveness (71% vs. 78%) and Timeliness (72% vs. 75%).
- The Equity domain saw the largest drop with 58% of respondents indicating positive influence in 2011 versus 31% in 2013.
- Based on the 33 pharmacies that responded to both surveys, the 2013 survey respondents were more likely to respond with neutral and negative responses for the IOM domains of Patient Safety, Patient Centeredness, and Equity than they did in 2011.

Barriers to e-Prescribing

- In 2011, the three leading barriers to e-prescribing as indicated by survey respondents were low prescriber activity (38%), prescription transaction fees (36%) and maintenance costs (33%).
- In 2013, the three leading barriers indicated were bugs in the e-prescribing process (38%), potential for an incomplete patient medication list (27%) and poor network connections in the area and/or network costs (21%).
- Of the 44 respondents that shared other barriers in 2013, more than two thirds reported various data entry issues as barriers to e-prescribing and 41% feel prescribers are not trained properly on the e-prescribing software.
- Independent pharmacies were more likely than chain/franchise pharmacies to indicate prescription transaction fees, low prescriber activity and maintenance costs as barriers to implementing e-prescribing.

In 2011, the three leading barriers to e-prescribing were low prescriber activity (38%), prescription transaction fees (36%) and maintenance costs (33%).

In 2013, the three leading barriers were bugs in the e-prescribing process (38%), potential for an incomplete patient medication list (27%) and poor network connections in the area and/or network costs (21%).

Types of Pharmacy Transactions

- 100% of enabled pharmacies reported processing new prescriptions electronically in 2011 compared with 98% in 2013.
- 89% of the enabled pharmacies reported processing renewal prescriptions electronically in 2011 compared with 96% in 2013.
- Fill notifications to prescribers (37% vs. 26%) and medication history send/receive (25% vs. 6%), decreased in prevalence from 2011 to 2013.

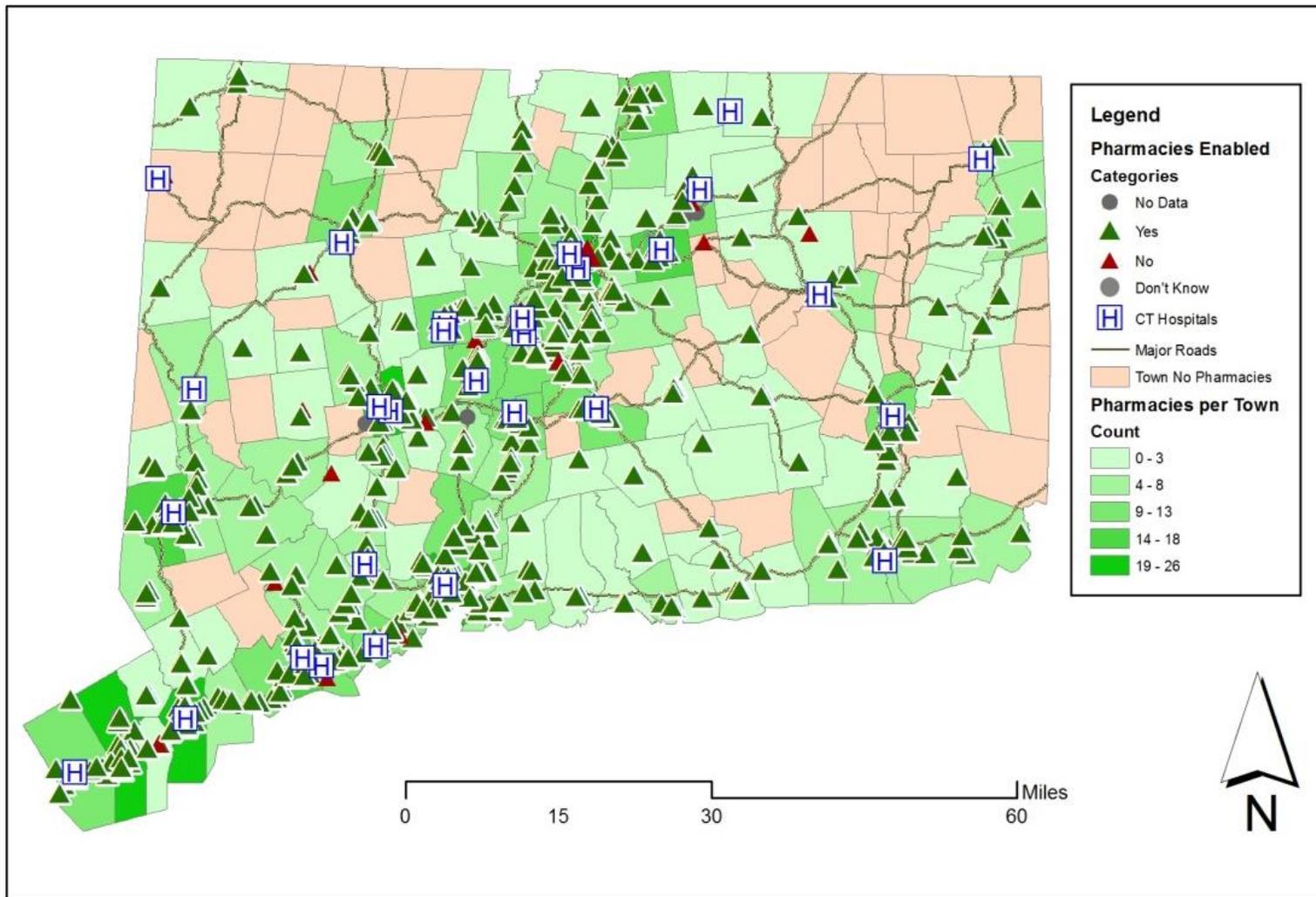
Knowledge of e-Prescribing Standards and Terminology

- In 2013 three out of five pharmacies reported using the Surescripts network for e-prescribing. This is most likely an under-representation by our survey respondents, since our Surescripts data files indicate that 93% of independent pharmacies and 99% of chain pharmacies were activated on the Surescripts network by the end of 2013.
- Mostly respondents were unaware of whether or not the pharmacy paid transaction fees (57%), used standards (40%), had a system compatible with HL7 messaging standards (90%) and used standard terminology (89%).

Awareness of Health Information Exchange

- The majority of respondents indicated no familiarity with CT-HIE (70% in 2011 and 74% in 2013).
- 57% of pharmacies indicated sending electronic transactions to physicians, physicians' assistants and nurse practitioners in 2011 compared with 82% in 2013.

Pharmacy Locations



What are the laboratories telling us about structured data?

We received 58 responses in 2011-12 and 34 responses in 2013 to statewide surveys administered to licensed laboratories in Connecticut that were classified as hospital-based or independent laboratories by the Centers for Disease Control. These 92 surveys represent 66 unique labs. The goal of the survey was to measure the extent of lab interoperability, measured by the percent of labs sending electronic lab results to providers in a structured format and the adoption of LOINC terminology.

In 2013, 63% of the Connecticut's hospitals were sharing lab results electronically which is higher than the national average of 56%. This represents a significant decrease from 77% in 2011-12. 50% of the independent labs were sending lab results electronically in 2013, an increase from 37% in 2011-12. Due to the low number of labs that responded to our survey, the results should be interpreted with caution.

Location

- In 2013, Hartford and New Haven counties accounted for 64.7% of the labs and urban-periphery and urban-core represented 82.4% of the labs that responded to our survey.

Type of Laboratory

- In 2011-12 survey, responding labs were almost equally divided between hospital (53%) and independent (47%) labs. In comparison, the majority (71%) of labs surveyed in 2013 identified themselves as hospital-based and 29% identified themselves as independent.

Laboratory Volume

- Almost half the respondents (45.0%) accounted for up to 499,999 billable tests per year in 2011-12 compared to 59% in 2013.
- The number of physician practices submitting orders to the surveyed labs ranged from 0 to 1,000 practices, with a median of 45 practices.
- About a third of labs (35%) reported that over 100 physicians submit orders to them.

Electronic Capabilities

- In 2011-12, 57% of laboratories surveyed sent results in structured format to ambulatory providers outside of their organization compared to 59% in 2013.
- The percentage of laboratories sending laboratory results to web portals was 24% in 2011-12; this increased to 33% of labs in 2013.
- In 2011-12, 34% of laboratories reported sending final laboratory results to EHRs; this decreased to 30% of labs in 2013.

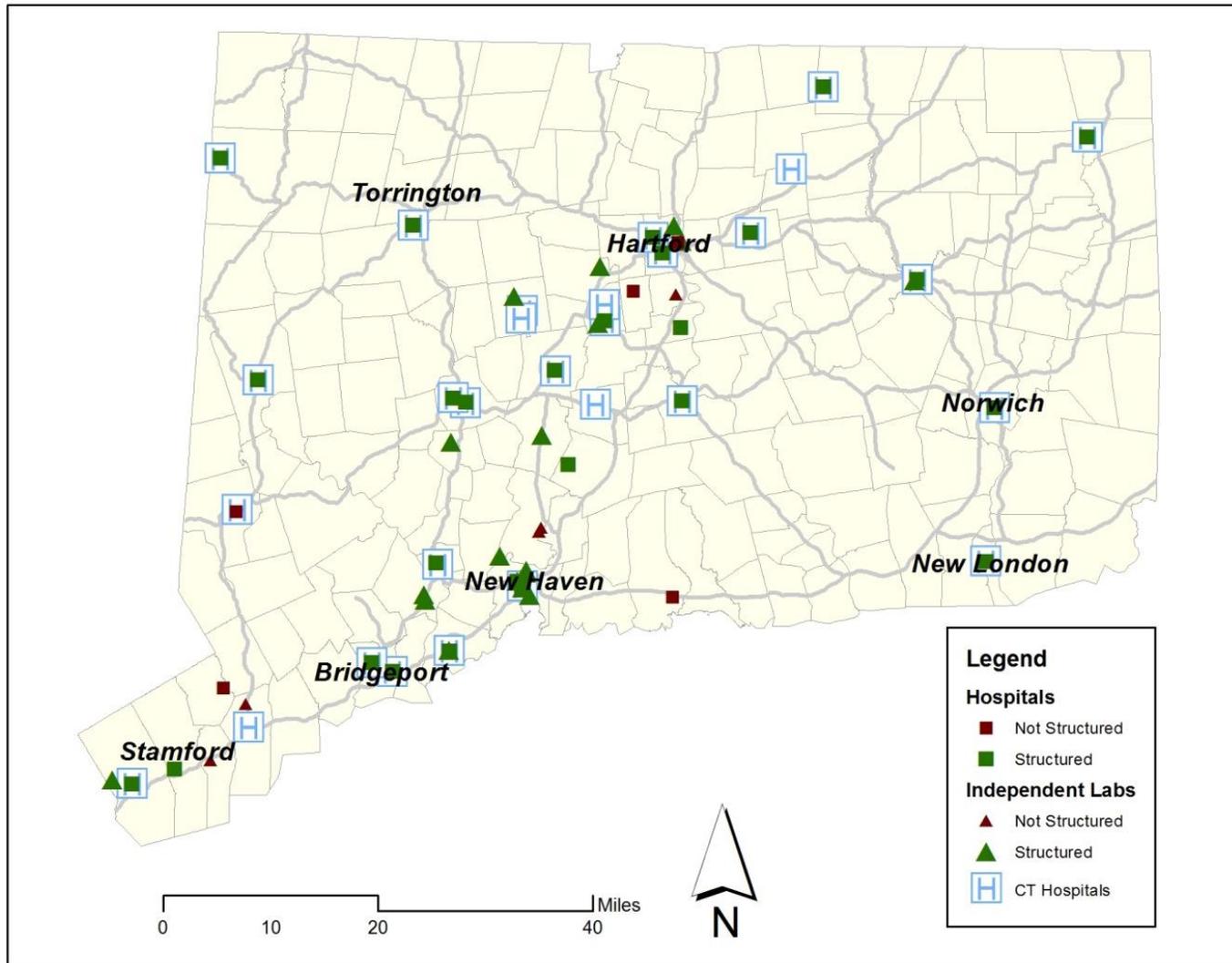
Adoption of Standards

- LOINC - In 2011-12, only 10.3% of the labs were sending results to ambulatory providers using LOINC standards, this increased to 27% in 2013. Of these, 2% of labs sent all of their lab results to ambulatory providers using LOINC in 2011-12; this increased to 12% in 2013.
- LRI Guide - In 2011-2012, 38% (35% did not know) of labs had not implemented the LRI Guide, compared to 68% (29% did not know) of labs in 2013.
- HL7 - Use of any HL7 version increased from 22% of respondents in 2011-2012 to 41% in 2013. In 2011-2012, 71% of labs did not know whether they used HL7 standards; this decreased to 47% of labs in 2013. Two labs reported that they used both HL7 version 2.5.1 and HL7 2.3.1 in 2011-2012.
- Direct messaging - In 2013, only 9% (N=3) of the laboratories mentioned using Direct messages for sending lab results while 82% of laboratories (N=27) reported not using Direct messaging.

Differences in Electronic Reporting By Lab Affiliation, Volume, and Socioeconomic Grouping

- In 2011-12, 77% of hospital labs sent structured electronic results compared to 63% in 2013. This compares with 37% of independent labs in 2011-2012 and 50% in 2013. This difference was statistically significant, that is the proportion of hospital labs with electronic capability was significantly higher than independent labs during 2011-12, but not in 2013.
- Labs that processed a higher volume of tests were more likely to send results electronically. In 2011-2012, 80% of labs receiving over one million billable tests per year sent results electronically.
- In 2011-12, 52% of independent labs processed fewer than 100,000 billable tests annually compared to 16% of hospital labs. This difference is significant and held for 2013.

Location of hospital-based and independent labs that send structured data



About the Author

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